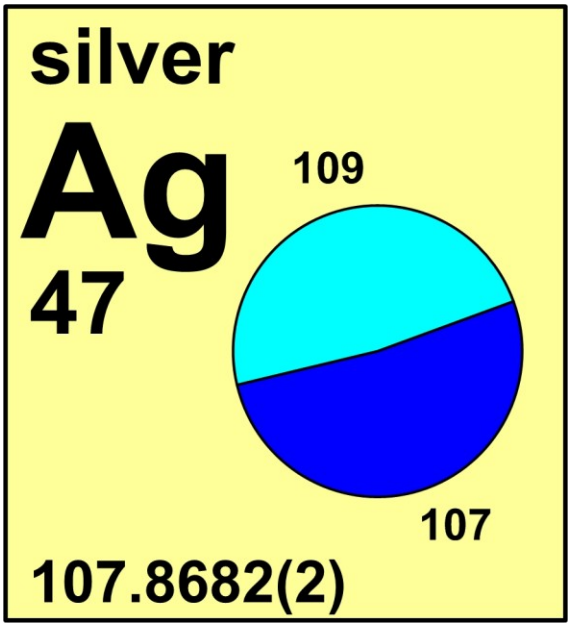
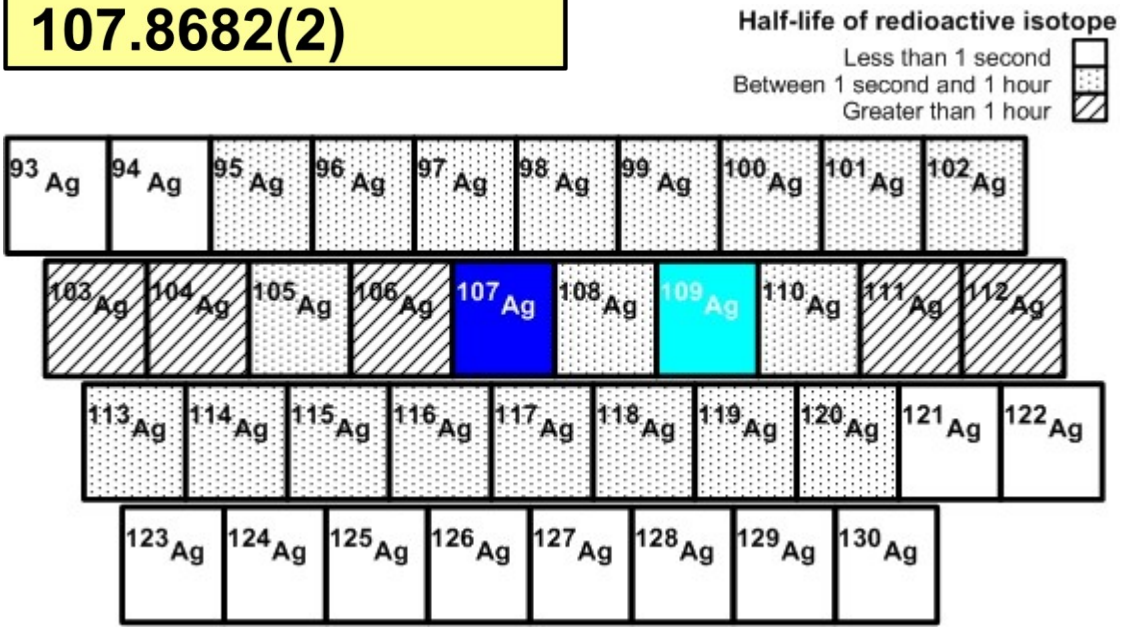
silver



Stable isotope	Atomic mass*	Mole fraction
^{107}Ag	106.905 097	0.518 39
^{109}Ag	108.904 752	0.481 61

* Atomic mass given in unified atomic mass units, u.



Important applications of stable and/or radioactive isotopes

Isotopes in geochronology

1) The ratio of ^{107}Pd/^{107}Ag is used in methods of geochronology to help date major thermal events in the solar system. Although ^{107}Ag is abundant naturally, ^{107}Ag is also the daughter product by beta decay of ^{107}Pd. If both excess ^{107}Ag and ^{107}Pd are present in the a cosmic sample, the material would have formed sometime after the half life of ^{107}Pd (6.5 million years) and the ratio of ^{107}Pd/^{107}Ag can be measured and used to help determine the starting point of that decay process and thus the formation of the material.

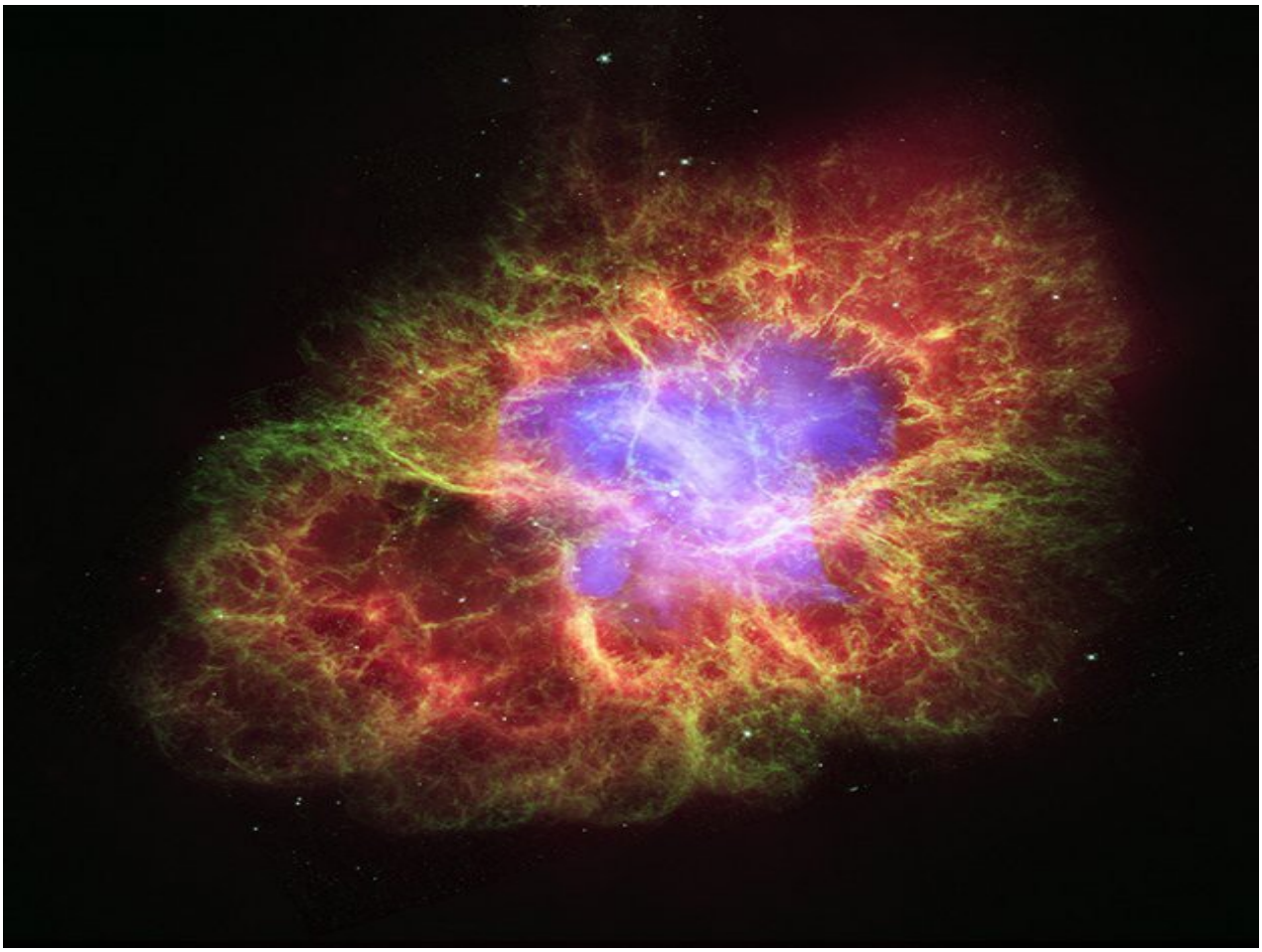


Figure 1: The crab nebula seen above is an example of an exploding star which is responsible for the release of heavy elements like ^{107}Ag and ^{107}Pd in to space.

Isotopes as environmental tracers

1) Variability of silver isotope fractionation (^{107}Ag/^{109}Ag) as evidence of anthropogenic input.

Isotopes in industry

1) ^{107}Ag is being studied as a possible target for cyclotron production of ^{103}Pd, although the current targets are ^{103}Rh or ^{104}Pd.
2) ^{109}Ag can be used to produce ^{110m}Ag for use as a gamma reference source.